

=> e Ca0.2Fe0.8Li04P/mf

E1 1 CA0.2FE0.8LA0.803TI0.2/MF  
E2 1 CA0.2FE0.8LA03/MF  
E3 0 --> CA0.2FE0.8LI04P/MF  
E4 1 CA0.2FE1.12O2.12Zn0.24/MF  
E5 1 CA0.2FE1.2Mg0.202.2/MF  
E6 1 CA0.2FE12O19Pb0.8/MF  
E7 1 CA0.2FE2.804/MF  
E8 1 CA0.2FE2.9Na0.905/MF  
E9 1 CA0.2FE2Mg0.804/MF  
E10 1 CA0.2FE2O4Zn0.8/MF  
E11 1 CA0.2FE4.31Lu0.17O12Sc0.69Y2.63/MF  
E12 1 CA0.2FE4.3In0.6012V0.1Y2.8/MF

=> e iron magnesium lithium phosphate/cn

E1 1 IRON MAGNESIUM HYDROXIDE THIOSULFATE (FE2Mg6(OH)16(S2O3))/CN  
E2 1 IRON MAGNESIUM HYDROXIDE THIOSULFATE (FE2Mg6(OH)16(S2O3)), TETRAHYDRATE/CN  
E3 0 --> IRON MAGNESIUM LITHIUM PHOSPHATE/CN  
E4 1 IRON MAGNESIUM MANGANESE ARSENATE HYDROXIDE (FEMg4Mn5(AsO4)2(OH)15)/CN  
E5 1 IRON MAGNESIUM MANGANESE CARBONATE HYDROXIDE (FE0.2-1Mg6Mn1-1.8(CO3)(OH)16)/CN  
E6 1 IRON MAGNESIUM MANGANESE CARBONATE HYDROXIDE (FE1-1.8Mg6Mn0.2-1(CO3)(OH)16)/CN  
E7 1 IRON MAGNESIUM MANGANESE CHLORIDE ((FE,MG,MN)Cl2)/CN  
E8 1 IRON MAGNESIUM MANGANESE HYDROXIDE PHOSPHATE (FE2Mg0.1-0.5Mn0.5-0.9(OH)2(PO4)2)/CN  
E9 1 IRON MAGNESIUM MANGANESE HYDROXIDE SILICATE/CN  
E10 1 IRON MAGNESIUM MANGANESE NICKEL OXIDE/CN  
E11 1 IRON MAGNESIUM MANGANESE NICKEL OXIDE (FE1.73Mg0.37Mn0.81Ni0.09O4)/CN  
E12 1 IRON MAGNESIUM MANGANESE NICKEL ZINC OXIDE/CN

=> e iron lithium magnesium phosphate/cn

E1 1 IRON LITHIUM MAGNESIUM OXIDE (FE4.06Li0.68Mg0.32O6.74)/CN  
E2 1 IRON LITHIUM MAGNESIUM OXIDE (FE4.19Li0.73Mg0.27O6.92)/CN  
E3 0 --> IRON LITHIUM MAGNESIUM PHOSPHATE/CN  
E4 1 IRON LITHIUM MAGNESIUM PHOSPHATE (FE0-0.1Li0.7-1Mg(PO4))/CN  
E5 1 IRON LITHIUM MAGNESIUM PHOSPHATE (FE0.03Li0.9Mg(PO4))/CN  
E6 1 IRON LITHIUM MAGNESIUM PHOSPHATE (FE0.04Li0.89Mg(PO4))/CN  
E7 1 IRON LITHIUM MAGNESIUM PHOSPHATE (FE0.07Li0.8Mg(PO4))/CN  
E8 1 IRON LITHIUM MAGNESIUM PHOSPHATE (FE0.1Li0.7Mg(PO4))/CN  
E9 1 IRON LITHIUM MAGNESIUM PHOSPHATE (FE0.2-1Li0.05-1.2Mg0-0.8(Po4))/CN  
E10 1 IRON LITHIUM MAGNESIUM PHOSPHATE (FE0.25LiMg0.75(PO4))/CN  
E11 1 IRON LITHIUM MAGNESIUM PHOSPHATE (FE0.7-1LiMg0-0.3(PO4))/CN  
E12 1 IRON LITHIUM MAGNESIUM PHOSPHATE (FE0.85LiMg0.15(PO4))/CN

=> s e1-e12

1 "IRON LITHIUM MAGNESIUM OXIDE (FE4.06LI0.68MG0.3206.74)"/CN  
1 "IRON LITHIUM MAGNESIUM OXIDE (FE4.19LI0.73MG0.2706.92)"/CN  
0 "IRON LITHIUM MAGNESIUM PHOSPHATE"/CN  
1 "IRON LITHIUM MAGNESIUM PHOSPHATE (FE0-0.1LI0.7-1MG(PO4))"/CN  
1 "IRON LITHIUM MAGNESIUM PHOSPHATE (FE0.03LI0.9MG(PO4))"/CN  
1 "IRON LITHIUM MAGNESIUM PHOSPHATE (FE0.04LI0.89MG(PO4))"/CN  
1 "IRON LITHIUM MAGNESIUM PHOSPHATE (FE0.07LI0.8MG(PO4))"/CN  
1 "IRON LITHIUM MAGNESIUM PHOSPHATE (FE0.1LI0.7MG(PO4))"/CN  
1 "IRON LITHIUM MAGNESIUM PHOSPHATE (FE0.2-1LI0.05-1.2MG0-0.8(PO4))"/CN  
1 "IRON LITHIUM MAGNESIUM PHOSPHATE (FE0.25LIMG0.75(PO4))"/CN  
1 "IRON LITHIUM MAGNESIUM PHOSPHATE (FE0.7-1LIMG0-0.3(PO4))"/CN  
1 "IRON LITHIUM MAGNESIUM PHOSPHATE (FE0.85LIMG0.15(PO4))"/CN  
L3 11 ("IRON LITHIUM MAGNESIUM OXIDE (FE4.06LI0.68MG0.3206.74)"/CN OR  
"IRON LITHIUM MAGNESIUM OXIDE (FE4.19LI0.73MG0.2706.92)"/CN OR  
"IRON LITHIUM MAGNESIUM PHOSPHATE"/CN OR "IRON LITHIUM MAGNESIUM  
PHOSPHATE (FE0-0.1LI0.7-1MG(PO4))"/CN OR "IRON LITHIUM MAGNESIUM  
PHOSPHATE (FE0.03LI0.9MG(PO4))"/CN OR "IRON LITHIUM MAGNESIUM  
PHOSPHATE (FE0.04LI0.89MG(PO4))"/CN OR "IRON LITHIUM MAGNESIUM  
PHOSPHATE (FE0.07LI0.8MG(PO4))"/CN OR "IRON LITHIUM MAGNESIUM  
PHOSPHATE (FE0.1LI0.7MG(PO4))"/CN OR "IRON LITHIUM MAGNESIUM  
PHOSPHATE (FE0.2-1LI0.05-1.2MG0-0.8(PO4))"/CN OR "IRON LITHIUM  
MAGNESIUM PHOSPHATE (FE0.25LIMG0.75(PO4))"/CN OR "IRON LITHIUM  
MAGNESIUM PHOSPHATE (FE0.7-1LIMG0-0.3(PO4))"/CN OR "IRON LITHIUM  
MAGNESIUM PHOSPHATE (FE0.85LIMG0.15(PO4))"/CN)

=> file caplus

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
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DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)	SINCE FILE ENTRY	TOTAL SESSION
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(FILE 'HOME' ENTERED AT 16:27:23 ON 17 MAY 2002)

FILE 'REGISTRY' ENTERED AT 16:27:35 ON 17 MAY 2002

E FEO.8LIMG0.204P/MF  
E CAO.2LIFE0.804P/MF  
E LIFE0.804PZN0.2/MF  
E FEO.8LI04PZN0.2/MF

L1 1 S E3  
E FEO.8LI04PSR0.2/MF  
E FEO.8LI04PPB0.2/MF  
E FEO.8LI04SN0.2/MF  
E FEO.8LI04PSN0.2/MF  
E CDO.2FE0.8LI04P/MF  
E BAO.2FE0.8LI04P/MF  
E BE0.2FE0.8LI04P/MF

FILE 'CAPLUS' ENTERED AT 16:39:24 ON 17 MAY 2002

L2 2 S L1

FILE 'STNGUIDE' ENTERED AT 16:40:54 ON 17 MAY 2002

FILE 'REGISTRY' ENTERED AT 16:43:24 ON 17 MAY 2002  
E CAO.2FE0.8LI04P/MF  
E IRON MAGNESIUM LITHIUM PHOSPHATE/CN  
E IRON LITHIUM MAGNESIUM PHOSPHATE/CN

L3 11 S E1-E12

FILE 'CAPLUS' ENTERED AT 16:48:35 ON 17 MAY 2002

=> s 13  
L4 13 L3

=> d ibib ab it hitstr 1-  
YOU HAVE REQUESTED DATA FROM 13 ANSWERS - CONTINUE? Y/(N):y

L4 ANSWER 1 OF 13 CAPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 2002:292205 CAPLUS  
TITLE: Nonaqueous electrolyte battery containing complex

lithium oxide positive electrode with olivine crystal  
structure

INVENTOR(S): Fukushima, Gen; Hosoya, Mamoru; Hisayama, Junji;  
Takahashi, Kimio; Sato, Atsushi; Okawa, Takeshi

PATENT ASSIGNEE(S): Sony Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.  
CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	JP 2002117903	A2	20020419	JP 2000-306878	20001005
AB	A battery comprises a neg. electrode, a pos. electrode from a compd. $LixFel_1-yMyPO_4$ ( $M$ is Mn, Cr, Co, Cu, Ni, V, Mo, Ti, Zn, Al, Ga, Mg, B, Nb; $x = 0.05-1.2$ , $y = 0-0.8$ ), and a separator. The pos. electrode compd. has an olivine crystal structure. The combined vol. (a) of the electrodes and vol. (b) of separator satisfy the following conditions: $0.17 \leq \frac{a}{b} \leq 0.39$ . The battery has improved balance of energy d.				
IT	Secondary battery separators (controlled vol. of; nonaq. electrolyte battery contg. complex lithium oxide pos. electrode with olivine crystal structure)				
IT	Secondary batteries (lithium; nonaq. electrolyte battery contg. complex lithium oxide pos. electrode with olivine crystal structure)				
IT	Battery electrodes (nonaq. electrolyte battery contg. complex lithium oxide pos. electrode with olivine crystal structure)				
IT	Olivine-group minerals RL: DEV (Device component use); USES (Uses) (nonaq. electrolyte battery contg. complex lithium oxide pos. electrode with olivine crystal structure)				
IT	Crystal structure (olivine; nonaq. electrolyte battery contg. complex lithium oxide pos. electrode with olivine crystal structure)				
IT	15365-14-7	407630-25-5	407630-29-9	407630-40-4	412267-76-6
	412267-77-7	412267-78-8	412267-79-9	412267-80-2	412267-81-3
	412267-82-4	412267-83-5	412267-84-6	412267-85-7	
	412267-86-8				
	RL: DEV (Device component use); USES (Uses) (pos. electrode contg.: nonaq. electrolyte battery contg. complex lithium oxide pos. electrode with olivine crystal structure)				
IT	412267-85-7 RL: DEV (Device component use); USES (Uses) (pos. electrode contg.: nonaq. electrolyte battery contg. complex lithium oxide pos. electrode with olivine crystal structure)				
RN	412267-85-7 CAPLUS				

ACCESSION NUMBER: 2002:292166 CAPLUS  
TITLE: Nonaqueous electrolyte secondary battery with lithium complex oxide positive electrode mix additionally containing lithium carbonate for improved charge-discharge cycle characteristic at high temperature  
INVENTOR(S): Hosoya, Mamoru; Fukushima, Gen  
PATENT ASSIGNEE(S): Sony Corp., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 14 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002117843	A2	20020419	JP 2000-306875	20001005
AB	A nonaq. electrolyte secondary battery comprises a $LixFe1-yMyPO_4$ (M is Mn, Cr, Co, Cu, Ni, V, Mo, Ti, Zn, Al, Ga, Mg, B, and/or Nb; $x = 0.05-1.2$ , $y \leq 0.8$ ), pos. electrode active mix addnl. contg. $Li_2CO_3$ . The battery has improved charge-discharge cycle characteristic at high temp.			
IT	Battery cathodes (nonaq. electrolyte secondary battery with lithium complex oxide pos. electrode mix addnl. contg. lithium carbonate for improved charge-discharge cycle characteristic at high temp.)			
IT	Olivine-group minerals			
RL: DEV (Device component use); USES (Uses)	(nonaq. electrolyte secondary battery with lithium complex oxide pos. electrode mix addnl. contg. lithium carbonate for improved charge-discharge cycle characteristic at high temp.)			
IT	15365-14-7, Iron lithium phosphate ( $FeLiPO_4$ ) 407630-25-5 407630-29-9 407630-40-4 412267-76-6 412267-77-7 412267-78-8 412267-79-9 412267-80-2 412267-81-3 412267-82-4 412267-83-5 412267-84-6 412267-85-7 412267-86-8			
RL: DEV (Device component use); USES (Uses)	(nonaq. electrolyte secondary battery with lithium complex oxide pos. electrode mix addnl. contg. lithium carbonate for improved charge-discharge cycle characteristic at high temp.)			
IT	554-13-2, Lithium carbonate			
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)	(nonaq. electrolyte secondary battery with lithium complex oxide pos. electrode mix addnl. contg. lithium carbonate for improved charge-discharge cycle characteristic at high temp.)			
IT	412267-85-7			
RL: DEV (Device component use); USES (Uses)	(nonaq. electrolyte secondary battery with lithium complex oxide pos. electrode mix addnl. contg. lithium carbonate for improved charge-discharge cycle characteristic at high temp.)			
RN	412267-85-7 CAPLUS			

L4 ANSWER 3 OF 13 CAPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 2002:272915 CAPLUS  
DOCUMENT NUMBER: 136:297401  
TITLE: Nonaqueous electrolyte battery with high discharge capacity  
INVENTOR(S): Sakai, Hideki; Fukushima, Yuzuru; Kuyama, Junji;  
Hosoya, Mamoru  
PATENT ASSIGNEE(S): Sony Corporation, Japan  
SOURCE: Eur. Pat. Appl., 17 pp.  
CODEN: EPXXDW  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1195838	A2	20020410	EP 2001-123895	20011005
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO			
JP 2002117908	A2	20020419	JP 2000-308303	20001006
PRIORITY APPLN. INFO.:			JP 2000-308303	A 20001006

AB A nonaq. electrolyte cell is disclosed having high discharge capacity, an improved capacity upkeep ratio and optimum cyclic characteristics. The nonaq. electrolyte cell has a cell device including a strip-shaped cathode material and a strip-shaped anode material, layered and together via a separator and coiled a plural no. of times, a nonaq. electrolyte soln., and a cell can for accommodating cell device and the nonaq. electrolyte soln. The cathode employs a cathode active material contg. a compd. of the olivinic structure represented by the general formula  $\text{Li}_x\text{Fe}_{1-y}\text{M}_y\text{P}_0_4$ , where M is at least one selected from the group consisting of Mn, Cr, Co, Cu, Ni, V, Mo, Ti, Zn, Al, Ga, Mg, B and Nb, with  $0.05 \leq x \leq 0.1$ ,  $0.1 \leq y \leq 0.8$ , with the compd. being used either singly or in combination with other materials. The ratio of an inner diam. d to an outer diam. D of cell device is selected so that  $0.05 < d/D < 0.5$ .

IT Secondary batteries  
(lithium: nonaq. electrolyte battery with high discharge capacity)  
IT Battery cathodes  
(nonaq. electrolyte battery with high discharge capacity)  
IT Carbon black, uses  
RL: DEV (Device component use): USES (Uses)  
(nonaq. electrolyte battery with high discharge capacity)  
IT lithium alloy, base  
RL: DEV (Device component use): USES (Uses)  
(nonaq. electrolyte battery with high discharge capacity)  
IT 7439-93-2, Lithium, uses 15365-14-7, Iron lithium phosphate felipo4  
407606-22-8, Chromium iron lithium phosphate ( $\text{CrO}_0.8\text{FeO}_0.2\text{LiO}_0.05\text{O}_1.2(\text{PO}_4)_2$ )  
407606-24-0, Cobalt iron lithium phosphate  
( $\text{CoO}_0.8\text{FeO}_0.2\text{LiO}_0.05\text{O}_1.2(\text{PO}_4)_2$ )  
407606-26-2, Copper iron lithium

phosphate ( $\text{Cu}_0\text{-}0.8\text{Fe}_0\text{-}2\text{-}1\text{Li}_0\text{-}0.05\text{-}1.2(\text{PO}_4)$ ) 407606-28-4, Aluminum iron lithium phosphate ( $\text{Al}_0\text{-}0.8\text{Fe}_0\text{-}2\text{-}1\text{Li}_0\text{-}0.05\text{-}1.2(\text{PO}_4)$ ) 407606-30-8, Gallium iron lithium phosphate ( $\text{Ga}_0\text{-}0.8\text{Fe}_0\text{-}2\text{-}1\text{Li}_0\text{-}0.05\text{-}1.2(\text{PO}_4)$ ) 407606-32-0 407606-34-2, Iron lithium manganese phosphate ( $\text{Fe}_0\text{-}2\text{-}1\text{Li}_0\text{-}0.05\text{-}1.2\text{Mn}_0\text{-}0.8(\text{PO}_4)$ ) 407606-36-4, Iron lithium nickel phosphate ( $\text{Fe}_0\text{-}2\text{-}1\text{Li}_0\text{-}0.05\text{-}1.2\text{Ni}_0\text{-}0.8(\text{PO}_4)$ ) 407606-39-7, Iron lithium vanadium phosphate ( $\text{Fe}_0\text{-}2\text{-}1\text{Li}_0\text{-}0.05\text{-}1.2\text{V}_0\text{-}0.8(\text{PO}_4)$ ) 407606-42-2, Iron lithium molybdenum phosphate ( $\text{Fe}_0\text{-}2\text{-}1\text{Li}_0\text{-}0.05\text{-}1.2\text{Mo}_0\text{-}0.8(\text{PO}_4)$ ) 407606-44-4, Iron lithium titanium phosphate ( $\text{Fe}_0\text{-}2\text{-}1\text{Li}_0\text{-}0.05\text{-}1.2\text{Ti}_0\text{-}0.8(\text{PO}_4)$ ) 407606-47-7, Iron lithium zinc phosphate ( $\text{Fe}_0\text{-}2\text{-}1\text{Li}_0\text{-}0.05\text{-}1.2\text{Zn}_0\text{-}0.8(\text{PO}_4)$ ) 407606-49-9, Iron lithium magnesium phosphate ( $\text{Fe}_0\text{-}2\text{-}1\text{Li}_0\text{-}0.05\text{-}1.2\text{Mg}_0\text{-}0.8(\text{PO}_4)$ ) 407606-51-3, Iron lithium niobium phosphate ( $\text{Fe}_0\text{-}2\text{-}1\text{Li}_0\text{-}0.05\text{-}1.2\text{Nb}_0\text{-}0.8(\text{PO}_4)$ ) 407629-83-8 407629-87-2 407629-90-7 407629-95-2 407630-01-7 407630-05-1 407630-10-8 407630-14-2 407630-25-5, Aluminum iron lithium phosphate ( $\text{Al}_0\text{-}0.7\text{Fe}_0\text{-}0.3\text{Li}(\text{PO}_4)$ ) 407630-29-9, Gallium iron lithium phosphate ( $\text{Ga}_0\text{-}0.7\text{Fe}_0\text{-}0.3\text{Li}(\text{PO}_4)$ ) 407630-35-7 407630-40-4, Boron iron lithium phosphate ( $\text{B}_0\text{-}0.75\text{Fe}_0\text{-}0.25\text{Li}(\text{PO}_4)$ ) 408501-54-2

RL: DEV (Device component use): USES (Uses)

(nonaq. electrolyte battery with high discharge capacity)

IT 407606-49-9, Iron lithium magnesium phosphate ( $\text{Fe}_0\text{-}2\text{-}1\text{Li}_0\text{-}0.05\text{-}1.2\text{Mg}_0\text{-}0.8(\text{PO}_4)$ ) 407630-35-7

RL: DEV (Device component use): USES (Uses)

(nonaq. electrolyte battery with high discharge capacity)

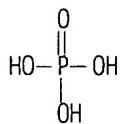
RN 407606-49-9 CAPPLUS

CN Iron lithium magnesium phosphate ( $\text{Fe}_0\text{-}2\text{-}1\text{Li}_0\text{-}0.05\text{-}1.2\text{Mg}_0\text{-}0.8(\text{PO}_4)$ ) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Mg	0 - 0.8	7439-95-4
Li	0.05 - 1.2	7439-93-2
Fe	0.2 - 1	7439-89-6

RN 407630-35-7 CAPPLUS

CN Phosphoric acid, iron(2+) lithium magnesium salt (4:1:4:3) (9CI) (CA INDEX NAME)



●1/4 Fe(II)

●Li

●3/4 Mg

L4 ANSWER 4 OF 13 CAPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 2002:272914 CAPLUS  
DOCUMENT NUMBER: 136:297400  
TITLE: Nonaqueous electrolyte secondary battery using olivinic lithium phosphorus oxide cathode active material  
INVENTOR(S): Okawa, Tsuyoshi; Hosoya, Mamoru; Kuyama, Junji; Fukushima, Yuzuru  
PATENT ASSIGNEE(S): Sony Corporation, Japan  
SOURCE: Eur. Pat. Appl., 15 pp.  
CODEN: EPXXDW  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1195837	A2	20020410	EP 2001-123893	20011005
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2002117907	A2	20020419	JP 2000-308302	20001006
JP 2000-308302 A 20001006				

PRIORITY APPLN. INFO.: AB In a battery, liq. leakage or destruction may be prevented as the apparent energy d. per unit vol. of the cell is maintained. The cell uses, as a cathode active material, a compd. of an olivinic crystal structure having the formula  $\text{Li}_{x}\text{Fe}_{1-x}\text{M}_y\text{PO}_4$ , where M is at least one selected from the group of Mn, Cr, Co, Cu, Ni, V, Mo, Ti, Zn, Al, Ga, Mg, B and Nb and 0.05 .ltoreq. x .ltoreq. 1.2 and 0 .ltoreq. y .ltoreq. 0.8. By adjusting the amt. of the electrolyte soln., the amt. of the void in the container is set so as to be not less than 0.14 mL and not more than 3.3 mL per 1 Ah of the cell capacity.

IT Secondary batteries  
(lithium; nonaq. electrolyte secondary battery using olivinic lithium

phosphorus oxide cathode active material)

IT Battery cathodes  
Composites  
(nonaq. electrolyte secondary battery using olivinic lithium phosphorus oxide cathode active material)

IT Coke  
RL: DEV (Device component use); USES (Uses)  
(pitch; nonaq. electrolyte secondary battery using olivinic lithium phosphorus oxide cathode active material)

IT 108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate 7440-44-0, Carbon, uses 15365-14-7, Iron lithium phosphate felipo4 21324-40-3, Lithium hexafluorophosphate 407606-22-8, Chromium iron lithium phosphate (Cr0-0.8Fe0.2-1Li0.05-1.2(P04)) 407606-24-0, Cobalt iron lithium phosphate (Co0-0.8Fe0.2-1Li0.05-1.2(P04)) 407606-26-2, Copper iron lithium phosphate (Cu0-0.8Fe0.2-1Li0.05-1.2(P04)) 407606-28-4, Aluminum iron lithium phosphate (Al0-0.8Fe0.2-1Li0.05-1.2(P04)) 407606-30-8, Gallium iron lithium phosphate (Ga0-0.8Fe0.2-1Li0.05-1.2(P04)) 407606-32-0 407606-34-2, Iron lithium manganese phosphate (Fe0.2-1Li0.05-1.2Mn0-0.8(P04)) 407606-36-4, Iron lithium nickel phosphate (Fe0.2-1Li0.05-1.2Ni0-0.8(P04)) 407606-39-7, Iron lithium vanadium phosphate (Fe0.2-1Li0.05-1.2V0-0.8(P04)) 407606-42-2, Iron lithium molybdenum phosphate (Fe0.2-1Li0.05-1.2Mo0-0.8(P04)) 407606-44-4, Iron lithium titanium phosphate (Fe0.2-1Li0.05-1.2Ti0-0.8(P04)) 407606-47-7, Iron lithium zinc phosphate (Fe0.2-1Li0.05-1.2Zn0-0.8(P04)) 407606-49-9, Iron lithium magnesium phosphate (Fe0.2-1Li0.05-1.2Mg0-0.8(P04)) 407606-51-3, Iron lithium niobium phosphate (Fe0.2-1Li0.05-1.2Nb0-0.8(P04)) 407629-83-8 407629-87-2 407629-90-7 407629-95-2 407630-01-7 407630-05-1 407630-10-8 407630-14-2 407630-19-7 407630-25-5, Aluminum iron lithium phosphate (Al0.7Fe0.3Li(P04)) 407630-29-9, Gallium iron lithium phosphate (Ga0.7Fe0.3Li(P04)) 407630-35-7 407630-40-4, Boron iron lithium phosphate (B0.75Fe0.25Li(P04)) 407630-46-0  
RL: DEV (Device component use); USES (Uses)  
(nonaq. electrolyte secondary battery using olivinic lithium phosphorus oxide cathode active material)

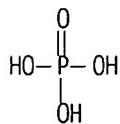
IT 407606-49-9, Iron lithium magnesium phosphate (Fe0.2-1Li0.05-1.2Mg0-0.8(P04)) 407630-35-7  
RL: DEV (Device component use); USES (Uses)  
(nonaq. electrolyte secondary battery using olivinic lithium phosphorus oxide cathode active material)

RN 407606-49-9 CAPLUS

CN Iron lithium magnesium phosphate (Fe0.2-1Li0.05-1.2Mg0-0.8(P04)) (9CI)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Mg	0 - 0.8	7439-95-4
Li	0.05 - 1.2	7439-93-2
Fe	0.2 - 1	7439-89-6

RN 407630-35-7 CAPLUS  
CN Phosphoric acid, iron(2+) lithium magnesium salt (4:1:4:3) (9CI) (CA  
INDEX NAME)



●1/4 Fe(II)

●Li

●3/4 Mg

L4 ANSWER 5 OF 13 CAPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 2002:272913 CAPLUS  
DOCUMENT NUMBER: 136:297399  
TITLE: Nonaqueous electrolyte secondary battery with a compound of an olivinic structure as a cathode active material  
INVENTOR(S): Okawa, Tsuyoshi; Hosoya, Mamoru; Kuyama, Junji; Fukushima, Yuzuru  
PATENT ASSIGNEE(S): Sony Corporation, Japan  
SOURCE: Eur. Pat. Appl., 15 pp.  
CODEN: EPXXDW  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1195836	A2	20020410	EP 2001-123892	20011005
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2002117833	A2	20020419	JP 2000-308301	20001006
PRIORITY APPLN. INFO.:			JP 2000-308301	A 20001006
AB A non-aq. electrolyte secondary cell contg. a compd. of an olivinic structure as a cathode active material is to be improved in load characteristics and cell capacity. To this end, there is provided a non-aq. electrolyte secondary cell including a cathode having a layer of a cathode active material contg. a compd. represented by the general formula				

LixFel-yMyPO<sub>4</sub>, where M is at least one selected from the group consisting of Mn, Cr, Co, Cu, Ni, V, Mo, Ti, Zn, Al, Ga, Mg, B and Nb, with 0.05 .ltoreq. x .ltoreq. 1.2 and 0 .ltoreq. y .ltoreq. 0.8, an anode having a layer of an anode active material and a non-aq. electrolyte, wherein the layer of the cathode active material has a film thickness in a range from 25 to 110 .mu.m. If a layer of a cathode active material is provided on each surface of a cathode current collector, the sum of the film thicknesses of the layers of the cathode active material ranges between 50 and 220 .mu.m. The non-aq. electrolyte may be a liq.-based electrolyte or a polymer electrolyte.

- IT Ball milling  
Battery cathodes  
Secondary batteries  
(nonaq. electrolyte secondary battery with compd. of olivinic structure as cathode active material)
- IT Carbon black, uses  
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(nonaq. electrolyte secondary battery with compd. of olivinic structure as cathode active material)
- IT 10377-52-3, Lithium phosphate 13977-75-8, Phosphoric acid, iron(3+) salt (3:2)  
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)  
(nonaq. electrolyte secondary battery with compd. of olivinic structure as cathode active material)
- IT 108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses 15365-14-7, Iron lithium phosphate felipo<sub>4</sub> 21324-40-3, Lithium hexafluorophosphate 407606-22-8, Chromium iron lithium phosphate (Cr0-0.8Fe0.2-1Li0.05-1.2(P0<sub>4</sub>)) 407606-24-0, Cobalt iron lithium phosphate (Co0-0.8Fe0.2-1Li0.05-1.2(P0<sub>4</sub>)) 407606-26-2, Copper iron lithium phosphate (Cu0-0.8Fe0.2-1Li0.05-1.2(P0<sub>4</sub>)) 407606-28-4, Aluminum iron lithium phosphate (Al0-0.8Fe0.2-1Li0.05-1.2(P0<sub>4</sub>)) 407606-30-8, Gallium iron lithium phosphate (Ga0-0.8Fe0.2-1Li0.05-1.2(P0<sub>4</sub>)) 407606-32-0 407606-36-4, Iron lithium nickel phosphate (Fe0.2-1Li0.05-1.2Ni0-0.8(P0<sub>4</sub>)) 407606-39-7, Iron lithium vanadium phosphate (Fe0.2-1Li0.05-1.2V0-0.8(P0<sub>4</sub>)) 407606-42-2, Iron lithium molybdenum phosphate (Fe0.2-1Li0.05-1.2Mo0-0.8(P0<sub>4</sub>)) 407606-44-4, Iron lithium titanium phosphate (Fe0.2-1Li0.05-1.2Ti0-0.8(P0<sub>4</sub>)) 407606-49-9, Iron lithium magnesium phosphate (Fe0.2-1Li0.05-1.2Mg0-0.8(P0<sub>4</sub>)) 407629-81-6, Iron lithium zinc phosphate (Fe0.2-1Li0.05-1.2Zn0.8(P0<sub>4</sub>)) 407629-82-7, Iron lithium niobium phosphate (Fe0.2-1Li0.05-1.2Nb0.8(P0<sub>4</sub>)) 407629-83-8 407629-87-2 407629-90-7 407629-95-2 407630-01-7 407630-05-1 407630-10-8 407630-14-2 407630-19-7 407630-25-5, Aluminum iron lithium phosphate (Al0.7Fe0.3Li(P0<sub>4</sub>)) 407630-29-9, Gallium iron lithium phosphate (Ga0.7Fe0.3Li(P0<sub>4</sub>)) 407630-35-7 407630-40-4, Boron iron lithium phosphate (B0.75Fe0.25Li(P0<sub>4</sub>)) 407630-46-0  
RL: DEV (Device component use); USES (Uses)  
(nonaq. electrolyte secondary battery with compd. of olivinic structure as cathode active material)

IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer  
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)  
(nonaq. electrolyte secondary battery with compd. of olivinic structure  
as cathode active material)

IT 7439-93-2, Lithium, uses  
RL: DEV (Device component use); PEP (Physical, engineering or chemical  
process); PYP (Physical process); PROC (Process); USES (Uses)  
(nonaq. electrolyte secondary battery with compd. of olivinic structure  
as cathode active material)

IT 407606-49-9, Iron lithium magnesium phosphate ( $\text{Fe}_{0.2-1}\text{Li}_{0.05-1.2}\text{Mg}_{0-0.8}(\text{PO}_4)$ ) 407630-35-7  
RL: DEV (Device component use); USES (Uses)  
(nonaq. electrolyte secondary battery with compd. of olivinic structure  
as cathode active material)

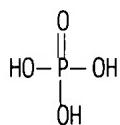
RN 407606-49-9 CAPLUS

CN Iron lithium magnesium phosphate ( $\text{Fe}_{0.2-1}\text{Li}_{0.05-1.2}\text{Mg}_{0-0.8}(\text{PO}_4)$ ) (9CI)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Mg	0 - 0.8	7439-95-4
Li	0.05 - 1.2	7439-93-2
Fe	0.2 - 1	7439-89-6

RN 407630-35-7 CAPLUS

CN Phosphoric acid, iron(2+) lithium magnesium salt (4:1:4:3) (9CI) (CA  
INDEX NAME)



●1/4 Fe(II)

●Li

●3/4 Mg

DOCUMENT NUMBER: 136:297398  
TITLE: Cathode and anode materials for solid nonaqueous electrolyte battery  
INVENTOR(S): Takahashi, Kimio; Hosoya, Mamoru; Miyake, Masami  
PATENT ASSIGNEE(S): Sony Corporation, Japan  
SOURCE: Eur. Pat. Appl., 22 pp.  
CODEN: EPXXDW  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1195835	A2	20020410	EP 2001-123773	20011004
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2002117902	A2	20020419	JP 2000-306877	20001005

PRIORITY APPLN. INFO.: JP 2000-306877 A 20001005

AB A battery is not deteriorated in cell characteristics and maintains the cell shape encapsulated in a laminate film even when overdischarged to a cell voltage of 0 V. The cell includes a cathode contg. a compd. having the formula  $LixFe1-yMyPO_4$ , where M is at least one selected from the group consisting of Mn, Cr, Co, Cu, Ni, V, Mo, Ti, Zn, Al, Ga, Mg, B and Nb, with  $0.05 \leq x \leq 1.2$  and  $0 \leq y \leq 0.8$ , an anode and a solid electrolyte. A cell member comprised of the cathode and the anode, layered together with the interposition of a solid electrolyte, is encapsulated in a laminate film.

IT Battery anodes  
Battery cathodes  
Battery electrolytes  
(cathode and anode materials for solid nonaq. electrolyte battery)  
IT 7440-44-0, Carbon, uses 15365-14-7, Iron lithium phosphate felipo4  
407606-22-8, Chromium iron lithium phosphate ( $Cr_0.8Fe_0.2-Li_0.05-1.2(Po_4)$ )  
407606-24-0, Cobalt iron lithium phosphate ( $Co_0.8Fe_0.2-Li_0.05-1.2(Po_4)$ )  
407606-26-2, Copper iron lithium phosphate ( $Cu_0.8Fe_0.2-Li_0.05-1.2(Po_4)$ )  
407606-28-4, Aluminum iron lithium phosphate ( $Al_0.8Fe_0.2-Li_0.05-1.2(Po_4)$ )  
407606-30-8, Gallium iron lithium phosphate ( $Ga_0.8Fe_0.2-Li_0.05-1.2(Po_4)$ )  
407606-32-0  
407606-34-2, Iron lithium manganese phosphate ( $Fe_0.2-Li_0.05-1.2Mn_0.8(Po_4)$ )  
407606-36-4, Iron lithium nickel phosphate ( $Fe_0.2-Li_0.05-1.2Ni_0.8(Po_4)$ )  
407606-39-7, Iron lithium vanadium phosphate ( $Fe_0.2-Li_0.05-1.2V_0.8(Po_4)$ )  
407606-42-2, Iron lithium molybdenum phosphate ( $Fe_0.2-Li_0.05-1.2Mo_0.8(Po_4)$ )  
407606-44-4, Iron lithium titanium phosphate ( $Fe_0.2-Li_0.05-1.2Ti_0.8(Po_4)$ )  
407606-47-7, Iron lithium zinc phosphate ( $Fe_0.2-Li_0.05-1.2Zn_0.8(Po_4)$ )  
407606-49-9, Iron lithium magnesium phosphate ( $Fe_0.2-Li_0.05-1.2Mg_0.8(Po_4)$ )  
407606-51-3, Iron lithium niobium phosphate ( $Fe_0.2-Li_0.05-1.2Nb_0.8(Po_4)$ )  
RL: DEV (Device component use): USES (Uses)  
(cathode and anode materials for solid nonaq. electrolyte battery)

IT 7439-93-2, Lithium, uses  
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
(cathode and anode materials for solid nonaq. electrolyte battery)

IT 407606-49-9, Iron lithium magnesium phosphate ( $\text{Fe}_{0.2-1}\text{Li}_{0.05-1.2}\text{Mg}_{0-0.8}(\text{PO}_4)$ )  
RL: DEV (Device component use); USES (Uses)  
(cathode and anode materials for solid nonaq. electrolyte battery)

RN 407606-49-9 CAPLUS

CN Iron lithium magnesium phosphate ( $\text{Fe}_{0.2-1}\text{Li}_{0.05-1.2}\text{Mg}_{0-0.8}(\text{PO}_4)$ ) (9CI)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Mg	0 - 0.8	7439-95-4
Li	0.05 - 1.2	7439-93-2
Fe	0.2 - 1	7439-89-6

L4 ANSWER 7 OF 13 CAPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 2002:272909 CAPLUS  
DOCUMENT NUMBER: 136:297395  
TITLE: Method for fabrication of cathode active material and  
a nonaqueous electrolyte battery  
INVENTOR(S): Hosoya, Mamoru; Fukushima, Yuzuru; Sakai, Hideki;  
Kuyama, Junji  
PATENT ASSIGNEE(S): Sony Corporation, Japan  
SOURCE: Eur. Pat. Appl., 31 pp.  
CODEN: EPXXDW  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1195827	A2	20020410	EP 2001-123894	20011005
			R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO	
JP 2002117848	A2	20020419	JP 2000-308300	20001006
JP 2002117849	A2	20020419	JP 2000-308313	20001006
PRIORITY APPLN. INFO.:			JP 2000-308300	A 20001006
			JP 2000-308313	A 20001006

AB The invention comprises a method for producing a cathode active material having superior cell characteristics through single-phase synthesis of a composite material composed of a compd. represented by the general formula  $\text{Li}_x\text{Fe}_{1-y}\text{M}_y\text{PO}_4$  and a carbon material pos. and a method for producing a non-aq. electrolyte cell employing the so produced cathode active material. To this end, the cathode active material is prep'd. by a step of

- mixing the starting materials for synthesis of the compd. represented by the general formula  $\text{Li}_x\text{Fe}_{1-y}\text{M}_y\text{PO}_4$ , a step of milling a mixt. obtained by the mixing step, a step of compressing the mixt. obtained by the mixing step to a preset d. and a step of sintering the mixt. obtained by the compressing step. A carbon material is added in any one of the above steps prior to the sintering step. The d. of the mixt. in the compressing step is set to not less than 1.71 g/cm<sup>3</sup> and not larger than 2.45 g/cm<sup>3</sup>.
- IT Ball milling  
Battery cathodes  
Composites  
Secondary batteries  
(method for fabrication of cathode active material and nonaq.  
electrolyte battery)
- IT Carbon black, uses  
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)  
(method for fabrication of cathode active material and nonaq.  
electrolyte battery)
- IT 7440-44-0, Carbon, uses 198782-39-7, Iron lithium phosphate  
( $\text{FeLiO}_1(\text{PO}_4)$ ) 407606-22-8, Chromium iron lithium phosphate  
( $\text{CrO}_0.8\text{FeO}_0.2\text{-}1\text{LiO}_0.05\text{-}1.2(\text{PO}_4)$ ) 407606-24-0, Cobalt iron lithium  
phosphate ( $\text{CoO}_0.8\text{FeO}_0.2\text{-}1\text{LiO}_0.05\text{-}1.2(\text{PO}_4)$ ) 407606-26-2, Copper iron  
lithium phosphate ( $\text{CuO}_0.8\text{FeO}_0.2\text{-}1\text{LiO}_0.05\text{-}1.2(\text{PO}_4)$ ) 407606-28-4, Aluminum  
iron lithium phosphate ( $\text{AlO}_0.8\text{FeO}_0.2\text{-}1\text{LiO}_0.05\text{-}1.2(\text{PO}_4)$ ) 407606-30-8,  
Gallium iron lithium phosphate ( $\text{GaO}_0.8\text{FeO}_0.2\text{-}1\text{LiO}_0.05\text{-}1.2(\text{PO}_4)$ )  
407606-32-0 407606-34-2, Iron lithium manganese phosphate  
( $\text{FeO}_0.2\text{-}1\text{LiO}_0.05\text{-}1.2\text{MnO}_0\text{-}0.8(\text{PO}_4)$ ) 407606-36-4, Iron lithium nickel  
phosphate ( $\text{FeO}_0.2\text{-}1\text{LiO}_0.05\text{-}1.2\text{NiO}_0\text{-}0.8(\text{PO}_4)$ ) 407606-39-7, Iron lithium  
vanadium phosphate ( $\text{FeO}_0.2\text{-}1\text{LiO}_0.05\text{-}1.2\text{V}_2\text{O}_0\text{-}0.8(\text{PO}_4)$ ) 407606-42-2, Iron  
lithium molybdenum phosphate ( $\text{FeO}_0.2\text{-}1\text{LiO}_0.05\text{-}1.2\text{MoO}_0\text{-}0.8(\text{PO}_4)$ )  
407606-44-4, Iron lithium titanium phosphate ( $\text{FeO}_0.2\text{-}1\text{LiO}_0.05\text{-}1.2\text{TiO}_0\text{-}0.8(\text{PO}_4)$ )  
407606-47-7, Iron lithium zinc phosphate ( $\text{FeO}_0.2\text{-}1\text{LiO}_0.05\text{-}1.2\text{ZnO}_0\text{-}0.8(\text{PO}_4)$ )  
407606-49-9, Iron lithium magnesium phosphate  
( $\text{FeO}_0.2\text{-}1\text{LiO}_0.05\text{-}1.2\text{MgO}_0\text{-}0.8(\text{PO}_4)$ ) 407606-51-3, Iron lithium niobium  
phosphate ( $\text{FeO}_0.2\text{-}1\text{LiO}_0.05\text{-}1.2\text{NbO}_0\text{-}0.8(\text{PO}_4)$ ) 407629-87-2 407629-90-7  
407629-95-2 407630-01-7 407630-10-8 407630-14-2  
RL: DEV (Device component use); USES (Uses)  
(method for fabrication of cathode active material and nonaq.  
electrolyte battery)
- IT 15365-14-7P, Iron lithium phosphate  $\text{FeLiPO}_4$   
RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(method for fabrication of cathode active material and nonaq.  
electrolyte battery)
- IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer  
RL: MOA (Modifier or additive use); USES (Uses)  
(method for fabrication of cathode active material and nonaq.  
electrolyte battery)
- IT 407606-49-9, Iron lithium magnesium phosphate ( $\text{FeO}_0.2\text{-}1\text{LiO}_0.05\text{-}1.2\text{MgO}_0\text{-}0.8(\text{PO}_4)$ )  
RL: DEV (Device component use); USES (Uses)

(method for fabrication of cathode active material and nonaqueous  
electrolyte battery)

RN 407606-49-9 CAPLUS

CN Iron lithium magnesium phosphate (Fe0.2-1Li0.05-1.2Mg0-0.8(PO4)) (9CI)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Mg	0 - 0.8	7439-95-4
Li	0.05 - 1.2	7439-93-2
Fe	0.2 - 1	7439-89-6

L4 ANSWER 8 OF 13 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 2002:272908 CAPLUS

DOCUMENT NUMBER: 136:297394

TITLE: Solid electrolyte cell

INVENTOR(S): Goto, Shuji; Hosoya, Mamoru; Endo, Takahiro

PATENT ASSIGNEE(S): Sony Corporation, Japan

SOURCE: Eur. Pat. Appl., 16 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1195826	A2	20020410	EP 2001-123774	20011004
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2002117844	A2	20020419	JP 2000-306876	20001005
PRIORITY APPLN. INFO.: JP 2000-306876 A 20001005				

AB A solid electrolyte cell in which cell characteristics are not deteriorated even on overdischarge to the cell voltage of 0 V, such that the shape of the cell encapsulated in the laminate film is maintained. The cell includes a cathode contg. a compd. represented by the general formula  $\text{Li}_x\text{Fe}_{1-y}\text{M}_y\text{PO}_4$  where  $0.05 \leq x \leq 1.2$ ,  $0 \leq y \leq 0.8$ , and M is at least one selected from the group consisting of Mn, Cr, Co, Cu, Ni, V, Mo, Ti, Zn, Al, Ga, Mg, B and Nb, an anode and a solid electrolyte. An electrode unit 1 comprised of the cathode and the anode layered together with interposition of the solid electrolyte is encapsulated with a laminate film 2.

IT Polyoxyalkylenes, uses

RL: DEV (Device component use); USES (Uses)  
(lithium complex; solid electrolyte cell)

IT Battery cathodes

Secondary batteries  
(solid electrolyte cell)

IT Fluoropolymers, uses

RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)

(solid electrolyte cell)

IT 7439-93-2D, Lithium, polyethylene oxide complex 7791-03-9, Lithium perchlorate 12031-65-1, Lithium nickel oxide linio2 12057-17-9, Lithium manganese oxide limn2o4 15365-14-7, Iron lithium phosphate felipo4 25322-68-3D, Polyethylene oxide, lithium complex 116327-69-6, Cobalt lithium nickel oxide Co0.1LiNi0.902 147812-18-8, Iron lithium manganese oxide Fe0.05LiMn1.9504 407606-22-8, Chromium iron lithium phosphate (Cr0-0.8Fe0.2-1Li0.05-1.2(P04)) 407606-24-0, Cobalt iron lithium phosphate (Co0-0.8Fe0.2-1Li0.05-1.2(P04)) 407606-26-2, Copper iron lithium phosphate (Cu0-0.8Fe0.2-1Li0.05-1.2(P04)) 407606-28-4, Aluminum iron lithium phosphate (Al0-0.8Fe0.2-1Li0.05-1.2(P04)) 407606-30-8, Gallium iron lithium phosphate (Ga0-0.8Fe0.2-1Li0.05-1.2(P04)) 407606-32-0 407606-34-2, Iron lithium manganese phosphate (Fe0.2-1Li0.05-1.2Mn0-0.8(P04)) 407606-36-4, Iron lithium nickel phosphate (Fe0.2-1Li0.05-1.2Ni0-0.8(P04)) 407606-39-7, Iron lithium vanadium phosphate (Fe0.2-1Li0.05-1.2V0-0.8(P04)) 407606-42-2, Iron lithium molybdenum phosphate (Fe0.2-1Li0.05-1.2Mo0-0.8(P04)) 407606-44-4, Iron lithium titanium phosphate (Fe0.2-1Li0.05-1.2Ti0-0.8(P04)) 407606-47-7, Iron lithium zinc phosphate (Fe0.2-1Li0.05-1.2Zn0-0.8(P04)) 407606-49-9, Iron lithium magnesium phosphate (Fe0.2-1Li0.05-1.2Mg0-0.8(P04)) 407606-51-3, Iron lithium niobium phosphate (Fe0.2-1Li0.05-1.2Nb0-0.8(P04)) 408331-94-2 408331-95-3 408331-96-4 408331-97-5 408331-99-7 408332-00-3 408332-01-4 408332-02-5 408332-03-6 408332-04-7 408332-05-8 408332-06-9 408332-07-0 408332-08-1 408332-09-2 408332-10-5 408332-11-6 408332-12-7 408332-13-8 408332-14-9 408332-15-0 408332-16-1 408332-17-2 408332-18-3 408332-19-4 408332-20-7 408332-21-8 408332-22-9 408332-23-0 408332-24-1 408332-25-2 408332-26-3 408332-27-4 408332-28-5 408332-29-6 408332-30-9 408332-31-0 408332-32-1 408332-33-2 408332-34-3 408332-35-4 408332-36-5 408332-37-6 408332-38-7 408332-39-8 408332-40-1 408332-42-3 408332-44-5 408332-45-6 408332-46-7 408332-47-8 408332-48-9 408332-50-3 408332-58-1, Aluminum cobalt lithium nickel oxide (Al0.01Co0.98LiNi0.0102)

RL: DEV (Device component use); USES (Uses)

(solid electrolyte cell)

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 7782-42-5, Graphite, uses 12190-79-3, Cobalt lithium oxide colio2 21324-40-3, Lithium hexafluorophosphate 24937-79-9, Pvdf

RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)

(solid electrolyte cell)

IT 407606-49-9, Iron lithium magnesium phosphate (Fe0.2-1Li0.05-1.2Mg0-0.8(P04))

RL: DEV (Device component use); USES (Uses)

(solid electrolyte cell)

RN 407606-49-9 CAPLUS

CN Iron lithium magnesium phosphate (Fe0.2-1Li0.05-1.2Mg0-0.8(P04)) (9CI)

(CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Mg	0 - 0.8	7439-95-4
Li	0.05 - 1.2	7439-93-2
Fe	0.2 - 1	7439-89-6

L4 ANSWER 9 OF 13 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 2002:256645 CAPLUS

DOCUMENT NUMBER: 136:297382

TITLE: Carbon-coated or carbon-crosslinked redox materials  
with transition metal-lithium oxide core for use as  
battery electrodes

INVENTOR(S): Armand, Michel; Gauthier, Michel; Magnan,  
Jean-Francois; Ravet, Nathalie

PATENT ASSIGNEE(S): Hydro-Quebec, Can.

SOURCE: PCT Int. Appl., 78 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: French

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002027824	A1	20020404	WO 2001-CA1350	20010921
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			

PRIORITY APPLN. INFO.: CA 2000-2320661 A 20000926

AB Carbon-coated redox materials suitable for use in battery electrodes  
consist of a core surrounded by a coating, or interconnected by carbon  
crosslinks, in which the core includes a compn. of formula  
 $LixM1-yM'y(XO4)n$ , in which  $y = 0-0.6$ ,  $x = 0-2$ ,  $n = 0-1.5$ ; M is a  
transition metal; and M' is an element of fixed valence selected from Mg<sup>2+</sup>,  
Ca<sup>2+</sup>, Al<sup>3+</sup>, and Zn<sup>2+</sup>, and X is S, P, and Si. Synthesis of the materials  
is carried out by reacting a balanced mixt. of appropriate precursors in a  
reducing atm., to adjust the valence of the transition metals, in the  
presence of a carbon source, which is then pyrolyzed. The resulting  
products exhibit an excellent elec. cond. and a highly enhanced chem.  
activity.

IT Silanes

RL: RCT (Reactant); RACT (Reactant or reagent)  
(alkoxy, silicon source; carbon-coated or carbon-crosslinked redox materials with transition metal-lithium oxide core for use as battery electrodes)

IT Polyoxyalkylenes, uses

RL: NUU (Other use, unclassified); USES (Uses)  
(alkyl ethers, oligomeric, aprotic solvent; carbon-coated or carbon-crosslinked redox materials with transition metal-lithium oxide core for use as battery electrodes)

IT Fluoropolymers, uses

Polyesters, uses  
Polyethers, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(binders; carbon-coated or carbon-crosslinked redox materials with transition metal-lithium oxide core for use as battery electrodes)

IT Battery cathodes

Battery electrodes  
Redox agents  
(carbon-coated or carbon-crosslinked redox materials with transition metal-lithium oxide core for use as battery electrodes)

IT Transition metals, uses

RL: TEM (Technical or engineered material use); USES (Uses)  
(electrodes contg.: carbon-coated or carbon-crosslinked redox materials with transition metal-lithium oxide core for use as battery electrodes)

IT 78-93-3, Methyl ethyl ketone, uses 96-48-0, Butyrolactone 96-49-1, Ethylene carbonate 107-21-1D, Ethylene glycol, alkyl ethers 108-32-7, Propylene carbonate 111-46-6D, Diethylene glycol, alkyl ethers 112-27-6D, Triethylene glycol, alkyl ethers 112-60-7D, Tetraethylene glycol, alkyl ethers 463-79-6D, Carbonic acid, C1-4-alkyl esters

RL: NUU (Other use, unclassified); USES (Uses)  
(aprotic solvent; carbon-coated or carbon-crosslinked redox materials with transition metal-lithium oxide core for use as battery electrodes)

IT 9011-14-7, Poly(methyl methacrylate) 24937-79-9, Poly(vinylidene difluoride) 25014-41-9, Polyacrylonitrile

RL: NUU (Other use, unclassified); USES (Uses)  
(binders; carbon-coated or carbon-crosslinked redox materials with transition metal-lithium oxide core for use as battery electrodes)

IT 50-99-7, Glucose, reactions 57-48-7, Fructose, reactions 57-50-1, Sucrose, reactions 58-86-6, Xylose, reactions 87-79-6, Sorbose 9002-88-4, Polyethylene 9003-07-0, Polypropylene 9004-34-6, Cellulose, reactions 9004-34-6D, Cellulose, esters 9004-35-7, Cellulose acetate 9005-25-8, Starch, reactions 25212-86-6, Poly(furfuryl alcohol) 43094-71-9, Ethylene-ethylene oxide copolymer

RL: RCT (Reactant); RACT (Reactant or reagent)  
(carbon source; carbon-coated or carbon-crosslinked redox materials with transition metal-lithium oxide core for use as battery electrodes)

IT 407640-63-5

RL: DEV (Device component use); USES (Uses)  
(electrodes contg.: carbon-coated or carbon-crosslinked redox materials with transition metal-lithium oxide core for use as battery electrodes)

- IT 7439-89-6D, Iron, mixed oxides 7439-96-5D, Manganese, mixed oxides  
7440-02-0D, Nickel, mixed oxides 7440-32-6D, Titanium, mixed oxides  
7440-47-3D, Chromium, mixed oxides 7440-48-4D, Cobalt, mixed oxides  
7440-50-8D, Copper, mixed oxides 7440-62-2D, Vanadium, mixed oxides  
13816-45-0, Triphylite 15365-14-7, Iron lithium phosphate (FeLiPO<sub>4</sub>)  
213467-46-0, Iron lithium manganese phosphate (FeLi<sub>2</sub>Mn(PO<sub>4</sub>)<sub>2</sub>)  
RL: TEM (Technical or engineered material use); USES (Uses)  
(electrodes contg.; carbon-coated or carbon-crosslinked redox materials  
with transition metal-lithium oxide core for use as battery electrodes)
- IT 90076-65-6  
RL: NUU (Other use, unclassified); USES (Uses)  
(electrolyte contg.; carbon-coated or carbon-crosslinked redox  
materials with transition metal-lithium oxide core for use as battery  
electrodes)
- IT 516-03-0, Ferrous oxalate  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(iron source; carbon-coated or carbon-crosslinked redox materials with  
transition metal-lithium oxide core for use as battery electrodes)
- IT 7429-90-5, Aluminum, uses 7440-31-5, Tin, uses 7440-36-0, Antimony,  
uses 7440-66-6, Zinc, uses 7782-42-5, Graphite, uses 39302-37-9,  
Lithium titanate 207803-50-7, Aluminum cobalt lithium magnesium nickel  
oxide 258511-24-9, Iron lithium nitride 263898-18-6, Cobalt manganese  
nitride 407640-62-4  
RL: DEV (Device component use); USES (Uses)  
(lithium-based cathodes contg.; carbon-coated or carbon-crosslinked  
redox materials with transition metal-lithium oxide core for use as  
battery electrodes)
- IT 638-38-0, Manganese(II) acetate  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(manganese source; carbon-coated or carbon-crosslinked redox materials  
with transition metal-lithium oxide core for use as battery electrodes)
- IT 546-89-4, Lithium acetate 553-91-3, Lithium oxalate 554-13-2, Lithium  
carbonate 1309-37-1, Ferric oxide, reactions 1310-65-2, Lithium  
hydroxide 1313-13-9, Manganese dioxide, reactions 1314-62-1, Vanadium  
pentoxide, reactions 1317-61-9, Magnetite, reactions 10045-86-0,  
Ferric phosphate 10102-24-6, Lithium silicate (Li<sub>2</sub>SiO<sub>3</sub>) 10377-48-7,  
Lithium sulfate 10377-52-3, Lithium phosphate (Li<sub>3</sub>PO<sub>4</sub>) 10421-48-4,  
Ferric nitrate 12057-24-8, Lithium oxide, reactions 12627-14-4  
13453-80-0, Lithium dihydrogen phosphate 63985-45-5, Lithium  
orthosilicate 407640-52-2, Iron lithium manganese phosphate  
(Fe0.1-LiMn0.9(Po4)) 407640-53-3, Iron lithium magnesium  
phosphate (Fe0.7-LiMg0.3(Po4)) 407640-54-4, Calcium iron lithium  
phosphate (Ca0.3Fe0.7-Li(Po4)) 407640-55-5 407640-56-6  
407640-57-7 407640-58-8 407640-59-9 407640-60-2 407640-61-3  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(metal source; carbon-coated or carbon-crosslinked redox materials with  
transition metal-lithium oxide core for use as battery electrodes)
- IT 25322-68-3D, Polyethylene glycol, alkyl ethers  
RL: NUU (Other use, unclassified); USES (Uses)  
(oligomeric, aprotic solvent; carbon-coated or carbon-crosslinked redox  
materials with transition metal-lithium oxide core for use as battery

electrodes)

IT 7664-38-2, Phosphoric acid, reactions 7664-38-2D, Phosphoric acid, esters 7783-28-0, Ammonium hydrogen phosphate 10124-54-6, Manganese phosphate  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(phosphorus source; carbon-coated or carbon-crosslinked redox materials with transition metal-lithium oxide core for use as battery electrodes)

IT 7631-86-9, Silica, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(silicon source; carbon-coated or carbon-crosslinked redox materials with transition metal-lithium oxide core for use as battery electrodes)

IT 7664-93-9, Sulfuric acid, reactions 7783-20-2, Ammonium sulfate, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(sulfur source; carbon-coated or carbon-crosslinked redox materials with transition metal-lithium oxide core for use as battery electrodes)

IT 407640-53-3, Iron lithium magnesium phosphate ( $\text{Fe0.7-1LiMg0-0.3(PO}_4\right)$ )  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(metal source; carbon-coated or carbon-crosslinked redox materials with transition metal-lithium oxide core for use as battery electrodes)

RN 407640-53-3 CAPLUS

CN Iron lithium magnesium phosphate ( $\text{Fe0.7-1LiMg0-0.3(PO}_4\right)$ ) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Mg	0 - 0.3	7439-95-4
Li	1	7439-93-2
Fe	0.7 - 1	7439-89-6

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 10 OF 13 CAPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 2002:9172 CAPLUS  
DOCUMENT NUMBER: 136:225905  
TITLE: Clustering of  $\text{Fe}^{3+}$  in the  $\text{Li}_{1-3x}\text{Fe}_x\text{MgPO}_4$  ( $0 < x < 0.1$ ) solid solution  
AUTHOR(S): Goni, Aintzane; Lezama, Luis; Pujana, Ainhoa;  
Arriortua, Maria Isabel; Rojo, Teofilo  
CORPORATE SOURCE: Universidad del País Vasco, Departamento Química  
Inorgánica, Bilbao, 48080, Spain  
SOURCE: International Journal of Inorganic Materials (2001),  
3(7), 937-942  
CODEN: IJIMCR; ISSN: 1466-6049  
PUBLISHER: Elsevier Science Ltd.  
DOCUMENT TYPE: Journal  
LANGUAGE: English

- AB The Li<sub>1-3x</sub>Fe<sub>x</sub>MgPO<sub>4</sub> (0<x<0.1) solid soln. was prep'd. by solid state synthesis. The structure of these phases was detd. by x-ray diffraction on polycryst. samples, being isostructural with LiMgPO<sub>4</sub>. Fe<sup>3+</sup> substitutes part of the Li<sup>+</sup> ions in the channels of the LiMgPO<sub>4</sub> structure along the [010] direction, creating cation vacancies. The IR bands corresponding to the vibrational modes of the phosphate groups undergo a gradual widening with the amt. of inserted iron as a consequence of the increase of disorder in the structure. The EPR spectra show signals with an effective g' = 4.0. This fact can be attributed to the presence of high spin Fe<sup>3+</sup> ions in orthorhombic symmetry. The increase of Fe<sup>3+</sup> in the compds. leads to a broadening of the Lorentzian EPR signals indicating the existence of magnetic interactions between the Fe<sup>3+</sup> ions. Magnetic susceptibility measurements on the Li<sub>1-3x</sub>Fe<sub>x</sub>MgPO<sub>4</sub> (0<x<0.1) solid soln. show antiferromagnetic behaviors which can be explained considering that the doped Fe<sup>3+</sup> ions exhibit a short range magnetic order, forming clusters assocd. with the vacancies in the structure.
- IT Antiferromagnetic ordering  
Crystal structure  
ESR (electron spin resonance)  
Magnetic susceptibility  
Molecular structure  
(of lithium iron magnesium phosphate (Li<sub>1-3x</sub>Fe<sub>x</sub>MgPO<sub>4</sub> (0<x<0.1)) solid soln. contg. Fe<sup>3+</sup> clusters assocd. with vacancies)
- IT 210709-38-9P, Iron lithium magnesium phosphate (Fe<sub>0.03</sub>Li<sub>0.9</sub>MgPO<sub>4</sub>)  
210709-40-3P, Iron lithium magnesium phosphate (Fe<sub>0.1</sub>Li<sub>0.7</sub>MgPO<sub>4</sub>)  
402519-34-0P, Iron lithium magnesium phosphate  
(Fe<sub>0-0.1</sub>Li<sub>0.7-1</sub>Mg(PO<sub>4</sub>)) 402519-35-1P, Iron lithium magnesium phosphate (Fe<sub>0.07</sub>Li<sub>0.8</sub>Mg(PO<sub>4</sub>))  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(prepn., crystal structure, ESR and magnetic properties)
- IT 1310-65-2, Lithium hydroxide (LiOH) 7722-76-1, Monoammonium phosphate  
10377-60-3 10421-48-4, Iron nitrate (Fe(NO<sub>3</sub>)<sub>3</sub>)  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reactant for prepn. of lithium iron magnesium phosphate  
(Li<sub>1-3x</sub>Fe<sub>x</sub>MgPO<sub>4</sub> (0<x<0.1)) solid soln. contg. Fe<sup>3+</sup> clusters assocd.  
with vacancies)
- IT 210709-38-9P, Iron lithium magnesium phosphate (Fe<sub>0.03</sub>Li<sub>0.9</sub>MgPO<sub>4</sub>)  
210709-40-3P, Iron lithium magnesium phosphate (Fe<sub>0.1</sub>Li<sub>0.7</sub>MgPO<sub>4</sub>)  
402519-34-0P, Iron lithium magnesium phosphate  
(Fe<sub>0-0.1</sub>Li<sub>0.7-1</sub>Mg(PO<sub>4</sub>)) 402519-35-1P, Iron lithium magnesium phosphate (Fe<sub>0.07</sub>Li<sub>0.8</sub>Mg(PO<sub>4</sub>))  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(prepn., crystal structure, ESR and magnetic properties)
- RN 210709-38-9 CAPLUS
- CN Iron lithium magnesium phosphate (Fe<sub>0.03</sub>Li<sub>0.9</sub>Mg(PO<sub>4</sub>)) (9CI) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
04P	1	14265-44-2

Print selected from Online session Page 23 05/17/2002

Mg	1	7439-95-4
Li	0.9	7439-93-2
Fe	0.03	7439-89-6

RN 210709-40-3 CAPLUS

CN Iron lithium magnesium phosphate ( $Fe0.1Li0.7Mg(P04)$ ) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Mg	1	7439-95-4
Li	0.7	7439-93-2
Fe	0.1	7439-89-6

RN 402519-34-0 CAPLUS

CN Iron lithium magnesium phosphate ( $Fe0-0.1Li0.7-1Mg(P04)$ ) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Mg	1	7439-95-4
Li	0.7 - 1	7439-93-2
Fe	0 - 0.1	7439-89-6

RN 402519-35-1 CAPLUS

CN Iron lithium magnesium phosphate ( $Fe0.07Li0.8Mg(P04)$ ) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Mg	1	7439-95-4
Li	0.8	7439-93-2
Fe	0.07	7439-89-6

REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 11 OF 13 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 2001:225610 CAPLUS

DOCUMENT NUMBER: 134:254632

TITLE: Secondary lithium batteries using lithium iron phosphate cathodes

INVENTOR(S): Takahashi, Masaya; Tobishima, Shinichi; Takei, Koji; Sakurai, Yoji

PATENT ASSIGNEE(S): Nippon Telegraph and Telephone Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	JP 2001085010	A2	20010330	JP 1999-261394	19990916
AB	The batteries use $\text{Li}_z\text{Fe}_1-y\text{X}_y\text{PO}_4$ ( $0 < z \leq 1$ ; X = element electrochem. stable in 3-4 V potential vs. Li std. potential) having olivine-type structure as the cathode active materials. Preferably, the X is Mg, Co, Ni, and/or Zn. The batteries, capable of charging and discharging at $\geq 4$ V, inhibit decompn. of electrolyte, and show improved discharge capacity and cycling performance.				
IT	Secondary batteries (secondary Li batteries using lithium iron phosphate cathodes)				
IT	Battery cathodes (secondary; secondary Li batteries using lithium iron phosphate cathodes)				
IT	331622-62-9P, Iron lithium nickel phosphate ( $\text{Fe}0.8\text{LiNi}0.2(\text{PO}_4)$ ) 331622-63-0P, Cobalt iron lithium phosphate ( $\text{Co}0.2\text{Fe}0.8\text{Li}(\text{PO}_4)$ ) 331622-64-1P, Cobalt iron lithium phosphate ( $\text{Co}0.1\text{Fe}0.9\text{Li}(\text{PO}_4)$ ) 331622-65-2P, Iron lithium zinc phosphate ( $\text{Fe}0.8\text{LiZn}0.2(\text{PO}_4)$ ) 331622-66-3P, Iron lithium magnesium phosphate ( $\text{Fe}0.85\text{LiMg}0.15(\text{PO}_4)$ )				
IT	RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses) (cathodes; secondary Li batteries using lithium iron phosphate cathodes)				
IT	331622-66-3P, Iron lithium magnesium phosphate ( $\text{Fe}0.85\text{LiMg}0.15(\text{PO}_4)$ ) RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses) (cathodes; secondary Li batteries using lithium iron phosphate cathodes)				
RN	331622-66-3 CAPLUS				
CN	Iron lithium magnesium phosphate ( $\text{Fe}0.85\text{LiMg}0.15(\text{PO}_4)$ ) (9CI) (CA INDEX NAME)				

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Mg	0.15	7439-95-4
Li	1	7439-93-2
Fe	0.85	7439-89-6

ACCESSION NUMBER: 1998:386203 CAPLUS  
DOCUMENT NUMBER: 129:144051  
TITLE:  $^{7\text{Li}}$  and  $^{31\text{P}}$  nuclear magnetic resonance studies of  $\text{Li}_{1-3x}\text{Mg}_{x}\text{Fe}_{x}\text{P}_4$   
AUTHOR(S): Goni, A.; Bonagamba, T. J.; Silva, M. A.; Panepucci, H.; Rojo, T.; Barberis, G. E.  
CORPORATE SOURCE: Facultad de Ciencias, Departamento de Quimica Inorganica, Universidad del Pais Vasco, Bilbao, Spain  
SOURCE: Journal of Applied Physics (1998), 84(1), 416-421  
CODEN: JAPIAU; ISSN: 0021-8979  
PUBLISHER: American Institute of Physics  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
AB The authors report a  $^{7\text{Li}}$  and  $^{31\text{P}}$  NMR study in the  $\text{Li}_{1-3x}\text{Mg}_{x}\text{Fe}_{x}\text{P}_4$  phases between 150 and 410 K. This study, complementary to those made using Moessbauer and magnetic neutron diffraction expts., confirms that the Fe ions enter as Fe(III) in the lattice, and that they enter substituting Li ions. Ionic cond. measurements, together with the NMR behavior of the  $^{7\text{Li}}$  and  $^{31\text{P}}$  NMR spectra show that no Li mobility occurs in the temp. range studied even with the addn. of the Fe impurity.  
IT Ionic conductivity  
Mossbauer effect  
NMR (nuclear magnetic resonance)  
( $^{7\text{Li}}$  and  $^{31\text{P}}$  NMR studies of  $\text{Li}_{1-3x}\text{Mg}_{x}\text{Fe}_{x}\text{P}_4$ )  
IT 7723-14-0, Phosphorus-31, properties 13775-51-4, Lithium magnesium phosphate ( $\text{LiMgP}_4$ ) 13982-05-3, Lithium-7, properties 210709-38-9, Iron lithium magnesium phosphate ( $\text{Fe}_0.03\text{Li}_0.9\text{Mg}(\text{P}_4)$ ) 210709-39-0, Iron lithium magnesium phosphate ( $\text{Fe}_0.04\text{Li}_0.89\text{Mg}(\text{P}_4)$ ) 210709-40-3, Iron lithium magnesium phosphate ( $\text{Fe}_0.1\text{Li}_0.7\text{Mg}(\text{P}_4)$ )  
RL: PRP (Properties)  
( $^{7\text{Li}}$  and  $^{31\text{P}}$  NMR studies of  $\text{Li}_{1-3x}\text{Mg}_{x}\text{Fe}_{x}\text{P}_4$ )  
IT 210709-38-9, Iron lithium magnesium phosphate ( $\text{Fe}_0.03\text{Li}_0.9\text{Mg}(\text{P}_4)$ ) 210709-39-0, Iron lithium magnesium phosphate ( $\text{Fe}_0.04\text{Li}_0.89\text{Mg}(\text{P}_4)$ ) 210709-40-3, Iron lithium magnesium phosphate ( $\text{Fe}_0.1\text{Li}_0.7\text{Mg}(\text{P}_4)$ )  
RL: PRP (Properties)  
( $^{7\text{Li}}$  and  $^{31\text{P}}$  NMR studies of  $\text{Li}_{1-3x}\text{Mg}_{x}\text{Fe}_{x}\text{P}_4$ )  
RN 210709-38-9 CAPLUS  
CN Iron lithium magnesium phosphate ( $\text{Fe}_0.03\text{Li}_0.9\text{Mg}(\text{P}_4)$ ) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Mg	1	7439-95-4
Li	0.9	7439-93-2
Fe	0.03	7439-89-6

RN 210709-39-0 CAPLUS

CN Iron lithium magnesium phosphate (Fe0.04Li0.89Mg(P04)) (9CI) (CA INDEX  
NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Mg	1	7439-95-4
Li	0.89	7439-93-2
Fe	0.04	7439-89-6

RN 210709-40-3 CAPLUS

CN Iron lithium magnesium phosphate (Fe0.1Li0.7Mg(P04)) (9CI) (CA INDEX  
NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Mg	1	7439-95-4
Li	0.7	7439-93-2
Fe	0.1	7439-89-6

L4 ANSWER 13 OF 13 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 1998:109474 CAPLUS

DOCUMENT NUMBER: 128:198744

TITLE: Crystallization of mixed ferrites from  
lithium-containing oxide melts

AUTHOR(S): Viting, L. M.; Burtseva, O. G.; Kuznetsova, O. A.;  
Motyl'kova, S. V.

CORPORATE SOURCE: Mosk. Gos. Univ., Moscow, Russia

SOURCE: Vestn. Mosk. Univ., Ser. 2: Khim. (1997), 38(5),  
338-341

CODEN: VMUKA5; ISSN: 0579-9384

PUBLISHER: Izdatel'stvo Moskovskogo Universiteta

DOCUMENT TYPE: Journal

LANGUAGE: Russian

AB The investigation of the crystn. of phases obtained during cooling of  
melt-solns. in Li-contg. solvent-Mg, Mn and Mg-Mn ferrite systems  
establishes the formation of mixed Li-M ferrites. The equil. coeffs. of  
substitution according to R. C. Linares (1965) were detd. The value of  
Ksub for given pair Li-M is const. for any compn. of initial charge which  
permits one to obtain mixed ferrites of prescribed compn. Soly. of  
ferrites in melt and value of Ksub is related to the diversity of  
acid-base properties of components in the solvent-ferrite system.

IT Phase diagram  
(of ferrites-lithium borate vanadate melt)

IT Crystallization  
(of mixed ferrites from lithium-contg. oxide melts)

IT 12063-10-4, Iron manganese oxide fe2mno4 12068-86-9, Iron magnesium

oxide fe2mgo4 13453-69-5, Lithium borate libo2 15593-56-3, Lithium vanadate li3vo4 98112-11-9, Iron magnesium manganese oxide fe6mgmn3o13 203795-59-9, Iron lithium magnesium oxide (Fe4.19Li0.73Mg0.2706.92) 203795-62-4, Iron lithium magnesium oxide (Fe4.06Li0.68Mg0.3206.74) 203795-65-7, Iron lithium magnesium oxide (Fe3.9Li0.64Mg0.3606.54) 203795-68-0, Iron lithium magnesium oxide (Fe3.78Li0.6Mg0.406.38) 203795-71-5, Iron lithium magnesium oxide (Fe3.68Li0.56Mg0.4406.24) 203795-74-8, Iron lithium manganese oxide (Fe2.76Li0.26Mn0.7405.02) 203795-77-1, Iron lithium manganese oxide (Fe2.69Li0.23Mn0.7704.92) 203795-80-6, Iron lithium manganese oxide (Fe2.6Li0.2Mn0.804.8) 203795-83-9, Iron lithium manganese oxide (Fe2.52Li0.18Mn0.8204.7) 203795-86-2, Iron lithium magnesium manganese oxide (Fe5.5Li0.5Mg0.5Mn1.48010.48) 203795-89-5, Iron lithium magnesium manganese oxide (Fe5.54Li0.46Mg0.54Mn1.62010.7) 203795-92-0, Iron lithium magnesium manganese oxide (Fe5.67Li0.33Mg0.67Mn2.01011.35)

RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(crystn. of mixed ferrites from lithium-contg. oxide melts)

IT 203795-59-9, Iron lithium magnesium oxide  
(Fe4.19Li0.73Mg0.2706.92) 203795-62-4, Iron lithium magnesium oxide (Fe4.06Li0.68Mg0.3206.74)  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(crystn. of mixed ferrites from lithium-contg. oxide melts)

RN 203795-59-9 CAPLUS

CN Iron lithium magnesium oxide (Fe4.19Li0.73Mg0.2706.92) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	6.92	17778-80-2
Mg	0.27	7439-95-4
Li	0.73	7439-93-2
Fe	4.19	7439-89-6

RN 203795-62-4 CAPLUS

CN Iron lithium magnesium oxide (Fe4.06Li0.68Mg0.3206.74) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	6.74	17778-80-2
Mg	0.32	7439-95-4
Li	0.68	7439-93-2
Fe	4.06	7439-89-6